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Preparing Activity: LANTNAVFACENGCOM **Based on UFGS-08110N**

ITALIAN GUIDE SPECIFICATIONS

Use for ITALIAN projects only
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SECTION 08110

STEEL DOORS AND FRAMES
05/02

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NOTE: This guide specification is issued by the Atlantic Division, Naval Facilities Engineering Command for regional use in Italy.
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NOTE: On the drawings, show:

1. Sizes of door openings, thicknesses of doors, swings, and travels of doors, and design of doors, whether flush panel, full flush, paneled, glazed, or louvered.

2. Details of nonstructural mullions, mullion covers, and removable mullions.

3. Type and thickness of glazing required; whether or not insulating glass units are required.

4. Method, type, and spacing required for anchoring door frames to adjoining construction.

5. Lintels and reinforcement required to support walls or partitions above doors.

6. Type of shop finish on steel surfaces.

7. Free area for louvers in doors.

8. Complete door schedule. Schedule should assign a separate number for each opening and should indicate door type and style, material, design, size, thickness, glazed or unglazed, class fire rating for fire doors, hardware set number, threshold material, if any, and material for frames, mullions, and transom bars.

9. Typical hardware locations and heigh above the

floor.

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NOTE: Hollow metal doors (and frames), both fire rated and un-rated, are available in Europe from a large number of sources. Most are fabricated with a flanged edge (as opposed to the square edge typical in American doors). This flange provided additional security by eliminating access to the latch and acts like an astragal closing the gap between the door and the frame for improved acoustical, thermal and fire resistance.

Hollow metal doors (and frames) are rated in minutes of fire resistance. Available ratings are REI 30, 60 and 120. The requirement for a fire rating derives from the application of the applicable laws and decrees of the Republic of Italy. As of this writing, Italy has not adopted the fire safety provisions of the Eurocode. Requirements for fire rated doors are described in UNI 9723. There is no central listing of fire doors, but rather, the doors are tested by certified laboratories. The most widely, used is Instituto Giordano. Certificates from this organization indicating a fire resistance rating are acceptable for use in fire rated situations and should be a required submittal. Inclusion of the requirements for UL fire rated doors will result in the importation of doors, frames and hardware from the US and the accompanying cost and delay.

Compatible frames are available from the same manufacturers and hardware is available from a number of sources. The configuration of the frames is unlike the typical American frames. Consult manufacturers' standard details prior to preparing door details.

The European style doors and frames limit the use of American style hardware. European style doors and frames are designed so that the latch is centered on the rabbet, rather than the door. Consequently, the lock and latch mechanisms are thinner than typical US hardware. The hinges are offset to allow for the rabbet. This has the added advantage of a wider clearance when the door is open to 90 degrees.

Some US facilities in Europe have base-wide keying systems. Typically, they are one of two US manufacturers: Best Locks or Medeco. Both make lock cores compatible (or, in the case of Best, can be made compatible) with European locks Refer to

Section 08710, "Door Hardware."

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Comments and suggestion on this specification are welcome and should be directed to the technical proponent of the specification. A listing of the technical proponents, including their organization designation and telephone number, is on the Internet.

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

COMMITTEE FOR THE STANDARDIZATION OF EUROPE (CEN)

EN 24	(1975) Doors, Measurement of Defects of General Flatness of Door Leaves
EN 25	(1975) Doors, Measurements of Dimensions and of Defects of Squareness of Door Leaves
EN 129	(1984) Methods of Testing Doors, Test for Deformation in Torsion of the Door Leaves
EN ISO 140-3	(1995) Acoustics - Measurement of Sound Insulation in Buildings and of Building Elements
EN 9774	(1990) Thermal Insulation Materials - Application Categories and Basic Requirements - Guidelines for the Harmonization of International Standards and Other Specifications
EN 10142	(1990) Continuously Hot-Dipped Zinc Coated Low Carbon Steel Sheet and Strip for Cold Forming - Technical Delivery Conditions
EN 10152	(1993) Electrolytically Zinc Coated Low Carbon Steel Sheet and Strip for Cold Forming - Technical Delivery Conditions

INTERNATIONAL STANDARDS ORGANIZATION (ISO)

ISO 834	(1975) Fire-Resistance Tests - Elements of Building Construction
ISO 3008	(1976) Fire-Resistance Tests - Door and Shutter Assemblies
ISO 3009	(1976) Fire Resistance Tests - Glazed Elements
ISO 4898	(1984) Cellular Plastics - Specification for Rigid Materials Used in the Thermal Insulation of Buildings
ISO 8272	(1985) Doorsets - Air Permeability Test
ISO 5925/1	(1981) Fire Tests - Evaluation of Performance of Smoke Control Door Assemblies - Part 1: Ambient Temperature Test

ENTE NAZIONALE ITALIANO DI UNIFCAZIONE (UNI)

UNI 7961	(1987) Buildings, Doors, Criteria for Classification
UNI 7962	Buildings, Doors, Terminology and Symbology
UNI 9723	(1990) Fire Resistance of Doors and Locking Devices - Test Methods and Classification Criteria

1.2 SUBMITTALS

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NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item is required.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G"

designation to indicate the approving authority. Recommended codes for Army projects are "RE" for Resident Engineer approval, "ED" for Engineering approval, and "AE" for Architect-Engineer approval. Codes following the "G" typically are not used for Navy projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy projects.

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Submit the following in accordance with section entitled "Submittal Procedures."

SD-02 Shop Drawings

Doors; G

Frames; G

Accessories

Show elevations, construction details, metal gages, hardware provisions, method of glazing, and installation details.

Doors Schedules; G

Frames Schedules; G

Submit door and frame locations, architectural door number, [blast resistant] [fire-rating.]

SD-03 Product Data

Doors; G

Frames; G

Accessories

Submit manufacturer's descriptive literature for doors, frames, and accessories. Include data and details on door construction, panel (internal) reinforcement, insulation, and door edge construction.

SD-04 Samples

Factory-applied enamel finish; G

Where colors are not indicated, submit manufacturer's standard colors and patterns [to the Contracting Officer] for selection.

Sample Door Assembly

After completion and receipt of approved submittals, Contractor shall assemble, erect/install on site one complete fire-rated door assembly [and one complete blast resistant exterior door assembly, both] complete with wall anchors, framing system, hardware for approval by the Contracting Officer prior to fabrication and actual procurement. Mock-up doors shall be applicable to all building. Approval will be for review of fabrication quality and conformance to specified requirements. Rejected mock-ups shall be removed from the project site. Contractor shall provide new mock-ups until acceptable by the Contracting Officer at no additional cost to the Government. Acceptable mock-ups shall remain at the project site for comparison to doors installed until completion of all door and frame work.

[SD-07 Certifications

Doors

Frames

Submit copies of certificates from recognized testing agencies indicating compliance with requirements.]

1.3 QUALITY ASSURANCE

1.3.1 Reinforcing Coordination

Contractor shall coordinate between the hardware and door manufacturers to ensure required reinforcing of door assemblies is provided at time of fabrication for required hardware including, but not limited to, locksets, hangars and closers.

1.3.2 Rated Assembly Coordination

Contractor shall coordinate selection of steel door and frame materials and products specified herein with door hardware specified in Section 08710, "Door Hardware" to ensure that fire rated assemblies meet all U. S. and Italian fire and safety requirements.

1.3.3 Manufacturer Qualifications

Obtain steel doors and frames through one source from a single manufacturer

1.4 PERFORMANCE REQUIREMENTS

1.4.1 [Blast Resistance Criteria

Design and fabricate all exterior steel door and frame assemblies to withstand a blast pressure of 62kPa (peak reflected) or an impulse of 448 kPa/ms

a. Direction of initial blast force to seat of door.

b. Frames may be damaged beyond repair but shall not collapse.

Glazing or door held by frames may be damaged beyond repair but shall be held in place by the frames.

c. Frames and anchoring shall hold assemblies in place through a 2 degree rotation.]

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver doors, frames, and accessories undamaged and with protective wrappings or packaging. [Strap knock-down frames in bundles.] [Provide temporary steel spreaders securely fastened to the bottom of each welded frame.] Store doors and frames on platforms under cover in clean, dry, ventilated, and accessible locations, with 6 mm 1/4-inch airspace between doors. Remove damp or wet packaging immediately and wipe affected surfaces dry. Replace damaged materials with new.

PART 2 PRODUCTS

2.1 STEEL DOORS

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NOTE: Door thickness varies among manufacturers. If not critical allow for a range or a minimum.
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UNI 7961 and UNI 7962 except as specified otherwise. Prepare doors to receive hardware specified in Section 08710, "Door Hardware." Undercut where indicated. Exterior doors shall have top edge closed flush and sealed to prevent water intrusion or connection. Doors shall be [44 mm], [60 mm] thick, unless otherwise indicated.

2.1.1 Door Construction

Doors shall be composite flush type, constructed of two outer sheets with edges continuously welded and finished flush, fully welded seamless construction with no visible seams or joints on faces. All welds shall be ground, filled and dressed smooth and flush with the surface. The outer face sheets shall be reinforced with interlocking vertical channels of "Z" members. Tops and bottoms of exterior doors shall have continuous channel closures 1.5 mm thick welded to the face sheets.

Close the tops and bottom of interior doors with a recessed channel end closure or a flush end closure treatment, 1.5 mm thick minimum. Resistance stiffen and sound deaden all doors.

2.1.1.1 Internal Door Construction

At time of fabrication (at the factory) weld additional metal reinforcing into the interior of door for mounting of mortised and surface-applied hardware. Provide frame reinforcement for hinges, door closers, and for locksets. Provide one of the following:

a. Continuous vertical stiffeners of not lighter than one mm steel

spaced not more than 150 mm apart and spot welded to both face sheets (or face panels) at intervals not greater than 150 mm.

b. An inner grid system of vertical and horizontal members with rectangular/square cross-sections of not lighter than one mm steel, welded or interlocked for maximum strength, spaced not to exceed and average of 300 mm in either direction, and spot weld to both face sheets at intervals not greater than 150 mm.

c. Continuous horizontal stiffeners of not lighter than one mm steel spot welded to both face sheets (or face panels) at intervals greater than 150 mm.

d. A continuous, formed sheet steel truss core, full height and width, spot welded to face sheets at intervals not greater than 150 mm in both directions.

2.1.2 Door Construction Duty

2.1.2.1 Standard Duty Doors (SD)

Face panels of 1.0 mm thick sheet steel, seamless, with core construction of polyurethane or polystyrene. Provide [where shown] [for doors No. [_____]].

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NOTE: Edit the following door grades as required for the project. There are significant cost differences among the three choices. Generally, the use of the doors is as follows: Standard Duty Doors: Interior for offices, classrooms, patient rooms, and storage rooms. Heavy Duty Doors: Exterior doors, BEQ bedrooms. Extra Heavy Duty Doors: High Security areas.

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2.1.2.2 Heavy Duty Doors (HD)

Face panels of 1.5 mm thick [galvanized] sheet steel, seamless, with vertical steel stiffeners, of size(s) and design(s) indicated with the space between the stiffeners filled with insulation core as specified in paragraph "INSULATION CORES". Provide heavy duty [where shown] [for doors No. [_____].]

2.1.2.3 Extra Heavy Duty Doors (EHD)

Face panels of 2.0 mm thick [galvanized] sheet steel, seamless with vertical steel stiffeners with the space between the stiffeners filled with insulation core as specified in paragraph "INSULATION CORES." [Provide Extra Heavy Duty [where shown] [for doors No. [_____]].]

2.1.3 Door Construction Tolerances

Provide doors with the following minimum tolerances:

a. Flatness: EN 24. Measurement repeated on both sides of door, tolerances below worded with door standing up in final hung position.

(1) Horizontal Centerline: Measure from a 1830 mm straight edge placed on the vertical center line of the door. Distance cannot be more than plus 4.76 mm minus 0 mm.

(2) Horizontal Edges: Measure from a 1830 mm straight edge when placed 25 mm in from and parallel to the lock and hinge edge. Dimension can not vary more than plus or minus 1.58 mm.

(3) Vertical Centerline: Measure from a straight edge 50 mm less than the width of the door on the horizontal centerline. Dimension shall have not variance from flat.

b. Squareness: EN 25. Measured diagonally from corner to corner across the face of the door, the two dimensions shall not vary more than plus or minus 1.58 mm.

c. Door Thickness: Thickness for a 44 mm to 60 mm door shall not vary more than plus or minus 1.58 mm.

d. Door width or Height: Door width or door height shall not vary more than plus or minus 1.19 mm.

e. Torsion Deformation: EN 129.

2.1.3 [Blast Resistance Fabrication

Fabricate all exterior doors and frames similar to requirements specified in "Standard Steel Doors" except provide additional reinforcing and heavier thickness metal as required to meet requirements specified in paragraph entitled "Blast" Resistance Criteria: herein.]

2.2 AVAILABLE MANUFACTURERS

Products manufactured by the following generally meet the requirements of this specification:

Ninz Firedoors di K. Ninz & Co. s.a.s.
Via Negrelli, 17
39100 Bolzano
Tel: 0471/92-1668
Fax: 0471/93-4570

Dierre S.p.A.
Strada per Statale per Chieri, 66/15
14019 Villanova d'Asti (AT)
Tel: 0141/94-9411
Fax: 0141/94-6427

FAEL
Via Ettore Majorana
Zona Industriale, Brindisi
Tel: 0831/54-6563

Nuova Metalsud (Drago)
via Appia SS 7 Km 634
74016 Massafra (TA)
Tel: 099/880-1697
Fax: 099/880-0597

Not all manufacturers produce all items specified. Products by other manufacturers meeting the specification requirements are also acceptable.

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NOTE: No standard reference is available, as of this writing, for acoustically rated steel doors. Specify a heavy duty door with mineral fiber insulated core, weather-stripping, and a solid grout filled frame. An alternative is to find a door that has been tested per EN ISO 140-3. In that case, specify the db reduction at all 18 frequencies. Sound Transmission Class (STC) rating not included in this standard.

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2.3 ACCESSORIES

2.3.1 Shelves for Dutch Doors

Fabricate shelves of steel not lighter than 1.5 mm thick, [130 mm wide] [of the size indicated]. Provide two brackets fabricated of the same material as the shelf. Mount shelf with sheet metal screws at one meter above the bottom of the door with a clearance of 150 mm at each side of the door.

2.3.2 Louvers

2.3.2.1 Interior Louvers

Louvers shall be stationary [sightproof] [and lightproof] type [where scheduled]. [Louvers for lightproof doors shall not transmit light.] Weld or tenon louver blades to frame and fasten assembly to door with moldings. Detachable moldings on room or nonsecurity side of door; on security side of door, moldings to be integral part of louver. Form louvers [of 0.9 mm thick] steel. [Louvers for lightproof doors shall have minimum of 20 percent net-free opening.] [Sightproof louvers to be inverted ["V"] ["Y"] blade design with minimum [55] [30] percent net-free opening.]

2.3.2.2 Exterior Louvers

[Louvers shall be inverted ["Y"] ["V"] ["Z"] type with minimum of [30] [55] [35] percent net-free opening.] Weld or tenon louver blades to continuous channel frame and weld assembly to door to form watertight assembly. Form louvers of hot-dip galvanized steel of same gage as door facings. Louvers

shall have steel-framed [insect] [bird] screens secured to room side and readily removable. Provide [aluminum wire cloth, 7 by 7 per 10 mm or 7 by 6 per 10 mm 18 by 18 or 18 by 16 inch mesh, for insect screens] [galvanized steel, 13 by 13 mm 1/2 by 1/2 inch mesh hardware cloth, for bird screens]. Net-free louver area to be before screening.

2.3.3 Astragals

For pairs of exterior steel doors which will not have aluminum astragals or removable mullions, as specified in Section 08710, "Door Hardware," provide overlapping steel astragals with the doors. [For interior pairs of [fire rated] [and] [smoke control] doors, provide stainless steel astragals complying with UNI 9723 for fire rated assemblies] [and] [for smoke control assemblies].

2.3.4 Moldings

Provide moldings around glass of interior and exterior doors and louvers of interior doors. Provide nonremovable moldings on outside of exterior doors and on corridor side of interior doors. Other moldings may be stationary or removable. Secure inside moldings to stationary moldings, or provide snap-on moldings. Muntins shall interlock at intersections and shall be fitted and welded to stationary moldings.

2.4 INSULATION CORES

EN 9774. Insulated cores shall be of type specified, shall provide maximum assembly U-value of .48 and shall conform to:

a. Rigid Polyurethane Foam: ISO 4898 Type RC/PUR, foamed-in-place or in board form, with oxygen index of not less than 22 percent; or,

b. Rigid Polystyrene Foam Board: ISO 4898, Type RC/PS; or,

c. Mineral Fiber: Rock wool or glass fiber.

2.5 STANDARD STEEL FRAMES

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NOTE: Designate whether frames are to be welded or knock-down field-assembled type. Welded frames must be built in. Typically use welded corners on frames in masonry walls. Slip-on drywall frames must be knock-down type. When both types are required for the project, modify paragraph to specify both types and locations where required.

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Form frames to sizes and shapes indicated, with [welded corners] [or] [knock-down field-assembled corners]. Provide steel frames for doors, [transoms,] [sidelights,] [mullions,] [cased openings,] [and] [interior glazed panels,] unless otherwise indicated.

2.5.1 Frame Tolerances

a. Frame Depth (Jamb Width or Depth Perpendicular to the Door Plane): The width dimension of the frame shall not vary more than plus or minus 1.58 mm. The width dimension of the preparation side of of frame to receive door shall not vary more than 0.39 mm.

b. Frame Throat Opening: The throat opening dimension shall not vary more than plus or minus 2.38 mm in width.

c. Frame Face (Frame Face Parallel to Door Plane): The frame face dimension shall not vary more than plus or minus 0.79 mm.

d. Frame Opening Width: The frame opening width to receive the door shall not vary more than 1.58 mm larger and .79 mm less than the fabrication dimension.

e. Hinge Preparation Recess: The recess cut out to receive the hinges shall not be less than the size of the hinge or more than 0.39 mm larger than the hinge.

[2.5.2 Welded Frames

Continuously weld frame faces at corner joints. Mechanically interlock or continuously weld stops and rabbets. Grind welds smooth.]

[2.5.3 Knock-Down Frames

Design corners for simple field assembly by concealed tenons, splice plates, or interlocking joints that produce square, rigid corners and a tight fit and maintain the alignment of adjoining members. Provide locknuts for bolted connections.]

2.5.4 Mullions and Transom Bars

Mullions and transom bars shall be closed or tubular construction and shall member with heads and jambs butt-welded thereto [or knock-down for field assembly]. Bottom of door mullions shall have adjustable floor anchors and spreader connections.

2.5.5 Stops and Beads

Form stops and beads from 0.9 mm thick 20-gage steel. Provide for glazed and other openings in standard steel frames. Secure beads to frames with oval-head, countersunk Phillips self-tapping sheet metal screws or concealed clips and fasteners. Space fasteners approximately 300 to 400 mm 12 to 16 inches on centers. Miter molded shapes at corners. Butt or miter square or rectangular beads at corners.

2.5.6 Terminated Stops

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NOTE: When stops (rabbet strips) are required to be terminated above the floor, they shall be indicated or specified; generally, terminated stops are used

in hospitals and similar buildings to eliminate projections on which wheels of beds and carts are caught and to eliminate small, dirt-catching corners.
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Where indicated, terminate interior door frame stops 150 mm 6 inches above floor. [Do not terminate stops of frames for [lightproof,] [soundproof,] [or lead-lined] doors.]

2.5.7 Cased Openings

Fabricate frames for cased openings of same material, gage, and assembly as specified for metal door frames, except omit door stops and preparation for hardware.

2.5.8 Anchors

Provide anchors to secure the frame to adjoining construction. Provide steel anchors, zinc-coated or painted with rust-inhibitive paint, not lighter than 2.0 mm gage.

2.5.8.1 Wall Anchors

Provide at least three anchors for each jamb. For frames which are more than 2285 mm 7.5 feet in height, provide one additional anchor for each jamb for each additional 760 mm 2.5 feet or fraction thereof.

a. Masonry: Provide anchors of corrugated or perforated steel straps or 5 mm 3/16 inch diameter steel wire, adjustable or T-shaped;

b. Stud partitions: Weld or otherwise securely fasten anchors to backs of frames. Design anchors to be fastened [to wood studs with nails,] [to closed steel studs with sheet metal screws, and to open steel studs by wiring or welding];

c. Completed openings: Secure frames to previously placed concrete or masonry with expansion bolts and

d. Solid plaster partitions: Secure anchors solidly to back of frames and tie into the lath. Provide adjustable top strut anchors on each side of frame for fastening to structural members or ceiling construction above. Size and type of strut anchors shall be as recommended by the frame manufacturer.

2.5.8.2 Floor Anchors

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NOTE: Extension clips at bottom of frames are usually required in locations where floor fill occurs on top of structural slabs, and the metal frames and partitions are installed before the fill is placed. In such cases, the drawings or specifications should indicate the distance required between the rough slab and finished floor.

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Provide floor anchors drilled for 10 mm 3/8-inch anchor bolts at bottom of each jamb member. [Where floor fill occurs, terminate bottom of frames at the indicated finished floor levels and support by adjustable extension clips resting on and anchored to the structural slabs.]

2.6 FIRE RATED DOORS AND FRAMES

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NOTE: The rating of fire doors, as shall be indicated or specified for each opening requiring labeled doors. When rated doors are necessary on both sides of a fire wall, adequate details shall be provided. A fire resistance rating cannot be obtained for double-acting doors or for steel angle frames. Metal frames to receive labeled wood fire doors must also be rated.

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UNI 9723. The construction and materials of door and frames shall be such to achieve the required fire-resistance rating in hours indicated on the door schedule. Fire-rated doors, frames and hardware shall be in accordance with Italian Norms. Where a view window is required the doors shall be rated with the corresponding size window. Fire-rated doors and frames, including those with sidelights and window framing, shall have a certification from the "Centro Studi ed Esperienze Antincendi" at the Italian Ministry of the Interior (Ministero dell" Interno) attesting the fire resistance rating.

2.6.1 Labels

Fire doors and frames shall bear a label indicating the name of the manufacturer, year of fabrication, name of certifying agency, certificate number and class of fire resistance and serial number with year of fabrication. Testing shall be in accordance with ISO 834 or ISO 3008 and ISO 3009 or ISO 5925/1. Labels shall be metal with raised letters. Labels shall be permanently affixed at the factory to frames and to the hinge edge of the door. Door labels shall not be painted. REI requirements shall be as indicated.

2.6.2 Oversized Doors

For fire doors and frames which exceed the size allowed by UNI 9723, furnish certificates stating that the doors and frames are identical in design, materials, and construction to a door which has been tested and meets the requirements for the class indicated.

2.6.3 Astragal on Fire [and Smoke] Doors

On pairs of rated fire [and smoke control] doors, conform to UNI 9723.

2.7 WEATHERSTRIPPING

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NOTE: Weatherstripping is specified in Section 08710, "Door Hardware," because it is usually furnished by the hardware supplier. Delete the bracketed subparagraph if it is not applicable.
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As specified in Section 08710, "Door Hardware."

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NOTE: Maximum air leakage rates are 2.19 by 10-5 cms/sq. m 0.5 cfm per sq. ft. of door area for residential swinging doors and 5.48 by 10-5 cms/ sq. m 1.25 cfm per sq. ft. of door area for non-residential swinging doors.
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2.7.1 [Integral Gasket

Black synthetic rubber gasket with tabs for factory fitting into factory slotted frames, or extruded neoprene foam gasket made to fit into a continuous groove formed in the frame, may be provided in lieu of head and jamb seals specified in Section 08710, "Door Hardware." Insert gasket in groove after frame is finish painted. Air leakage of weatherstripped doors shall not exceed [2.19 by 10-5] [5.48 by 10-5] cubic meters per second of air per square meter [0.5] [1.25] cubic feet per minute of air per square foot of door area per ISO 8272.]

2.8 HARDWARE PREPARATION

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NOTE: European standards for door hardware are evolving, but not yet fully developed. As of this writing, no standard has been found establishing standard hardware mounting heights and locations. Indicate typical hardware locations on the drawings.
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Space reinforce, drill, and tap doors and frames to receive finish hardware. Prepare doors and frames for hardware as indicated. Drill and tap for surface-applied hardware at the project site. Build additional reinforcing for surface-applied hardware into the door at the factory. Locate hardware as indicated. Punch door frames [, with the exception of frames that will have weatherstripping [or] [lightproof] [or] [soundproof] gasketing,] to receive a minimum of two rubber or vinyl door silencers on lock side of single doors and one silencer for each leaf at heads of double doors. Set lock strikes out to provide clearance for silencers.

2.8.1 Provisions for Hardware

Fabricate doors and frames to receive hardware specified in Section 08710 "Door Hardware". Doors shall be capable of accepting U. S. fabricated hardware to comply with fire rating requirements. Doors in which manufacturers provide their own lockset assembly and hinges and other

hardware as part of the door assembly shall be rejected (and shall not be installed on this project). Doors and frames with welded hinges are not acceptable. The hardware shall be as specified and shall be incorporated by the door manufacturer. Frames shall be prepared at the factory for installation of hardware. Frames shall be mortised, reinforced, drilled and tapped to templates to receive mortised template hinges, lock strikes flush bolts, and overhead door closer where required. Reinforcing plates shall be required for hardware. Cover boxes in back of hardware cut-outs shall be provided. Minimum reinforcement of doors and frames for hardware shall be as follows:

HARDWARE	MIN. THICKNESS	MIN. SIZE
Hinges	Door 3 mm Frame 3 mm	200 x 40 mm 200 x 40 mm
Mortise Locksets and Deadbolts	Door 1.5 mm Frame 1.5 mm	250 x 100 mm 160 x 40 mm
Surface Applied Closers	Door 2 mm Frame 2 mm	320 x 100 mm 350 mm x width of face, jamb or stop as required

2.9 FINISHES

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NOTE: Specify hot-dip zinc-coated steel for metal doors and frames in severely corrosive locations, e.g., exterior openings in marine or industrial environments. Specify electrolytic or hot-dip zinc-coated steel for metal doors and frames in mildly corrosive locations, e.g., other exterior doors. Uncoated steel is suitable for doors and frames in other locations, e.g., interior doors in most buildings. Specify field painting in Section 09900, "Paints and Coatings."

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2.9.1 Factory-Primed Finish

Unless specified otherwise, phosphate treat and factory prime metal doors and frames [, or paintable galvannealed steel without primer. Where coating is removed by welding, apply touchup of factory primer.]

2.9.2 Hot-Dip Zinc-Coated and Factory-Primed Finish

Fabricate [exterior] [interior] [scheduled] doors, frames and louvers from galvanized steel, EN 10142. Repair damaged zinc-coated surfaces by the application of zinc dust paint. Phosphate treat and factory prime zinc-coated surfaces. [Provide for door openings No. [_____]].

2.9.3 Electrolytic Zinc-Coated and Factory-Primed Finish

Fabricate [exterior] [interior] [scheduled] doors and frames from electrolytic zinc-coated steel, EN 10152. Phosphate treat and factory prime zinc-coated surfaces. Provide for [exterior doors] [door openings No. [_____]].

2.9.4 Factory-Applied Enamel Finish

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NOTE: One coat of factory-applied enamel finish is readily available in standard colors. Two coats and special colors add to cost and to delivery time.

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After factory priming, apply [one coat] [two coats] of [low-gloss] [medium-gloss] enamel to exposed surfaces. Separately bake or oven dry each coat. Drying time and temperature requirements shall be in accordance with the coating manufacturer's recommendations. Color(s) of finish coat shall be [as indicated] [_____] and shall match approved color sample(s).

2.10 FABRICATION AND WORKMANSHIP

Finished doors and frames shall be strong and rigid, neat in appearance, and free from defects, waves, scratches, cuts, dents, ridges, holes, warp, and buckle. Molded members shall be clean cut, straight, and true, with joints coped or mitered, well formed, and in true alignment. Dress exposed welded and soldered joints smooth. Design door frame sections for use with the wall construction indicated. Corner joints shall be well formed and in true alignment. Conceal fastenings where practicable. [Frames for use in solid plaster partitions shall be welded construction.] [On wraparound frames for masonry partitions, provide a throat opening 3 mm 1/8 inch larger than the actual masonry thickness.] [Design [other] frames in exposed masonry walls or partitions to allow sufficient space between the inside back of trim and masonry to receive calking compound.]

2.10.1 Grouted Frames

For frames to be installed in exterior walls and to be filled with mortar or grout, fill the stops with strips of rigid insulation to keep the grout out of the stops and to facilitate installation of stop-applied head and jamb seals.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Frames

Set frames plumb. Align, and brace securely until permanent anchors are set. Anchor bottoms of frames with expansion bolts or powder-actuated fasteners. Build in or secure wall anchors to adjoining construction. [Where frames require ceiling struts or overhead bracing, anchor frames to the struts or bracing.] [Backfill frames with mortar. When an additive is provided in the mortar, coat inside of frames with corrosion-inhibiting

bituminous material. For frames in exterior walls, ensure that stops are filled with rigid insulation before grout is placed.]

3.1.2 Doors

Hang doors in accordance with clearances as recommended by manufacturer. After erection and glazing, clean and adjust hardware.

3.1.3 Fire [and Smoke] Doors and Frames

Install fire doors and frames, including hardware, in accordance with UNI 9723. [Install [fire rated] smoke doors and frames in accordance with [UNI 9723.]]

3.2 PROTECTION

Protect doors and frames from damage. Repair damaged doors and frames prior to completion and acceptance of the project or replace with new, as directed. Wire brush rusted frames until rust is removed. Clean thoroughly. Apply an all-over coat of rust-inhibitive paint of the same type used for shop coat.

3.3 CLEANING

Upon completion, clean exposed surfaces of doors and frames thoroughly. Remove mastic smears and other unsightly marks.

-- End of Section --